

***Oreocharis wumengensis*, a new species of Gesneriaceae from northeastern Yunnan, China**

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Academic editor: W.-H. Chen | Received 14 January 2019 | Accepted 23 December 2019 | Published 26 August 2020

Citation: Cai L, Liu F-P, Yi X-B, Dao Z-L (2020) *Oreocharis wumengensis*, a new species of Gesneriaceae from northeastern Yunnan, China. In: Shui Y-M, Chen W-H, Ren M-X, Wen F, Hong X, Qiu Z-J, Wei Y-G, Kang M (Eds) Taxonomy of Gesneriaceae in China and Vietnam. PhytoKeys 157: 113–119. <https://doi.org/10.3897/phytokeys.157.33071>

Abstract

A new species of Gesneriaceae, *Oreocharis wumengensis* Lei Cai & Z.L.Dao from Wumeng Mountain area, Yanjin County, Yunnan Province, China, is described. The new species is morphologically similar to *O. panzhouensis* Lei Cai, Y.Guo & F.Wen in the shape of corolla, number of stigma and stamens, but it can be easily distinguished from this species by the leaf shape and indumentum characters of leaf blade, calyx and stamens. Detailed descriptions with photographs of the plant and holotype, and comparisons with morphologically similar species, are also provided.

Keywords

flora of Yunnan, morphology, new taxon, *Oreocharis*, Wumeng Mountain

Introduction

Many genera and species in the family Gesneriaceae have been redefined in the past two decades based on new evidence following the development of molecular phylogenetics (Möller et al. 2011, 2016; Weber et al., 2011a, 2011b). *Oreocharis* Benth was redefined in 2011 (Möller et al. 2011), and the vast majority associated species of the

other 10 genera were merged into the enlarged genera (Chen et al. 2014, Möller et al. 2014), including some new taxa described in recent years (Cai et al. 2015, 2017, 2019; Chen et al. 2017, 2018; Do et al. 2017; Guo et al. 2018; Han et al. 2017; Möller 2015; Möller et al. 2018; Wei et al. 2016; Yang et al. 2018), *Oreocharis s.l.* now comprises ca. 120 species, mainly with southern and southwestern Chinese distribution, but with a few species extending into Vietnam, Myanmar, India, Bhutan, Japan and Thailand (Cai et al. 2017, 2019; Chen 2016; Chen et al. 2017, 2018; Do et al. 2017; Guo and Wang 2014; Li and Wang 2004; Möller et al. 2018; Wang et al. 1990, 1998; Xu et al. 2017).

In April 2017, during field investigations in the Wumeng Mountain area (Yanjin County, northeastern Yunnan), an unknown species of Gesneriaceae without flowers was collected and then planted in Kunming Botanical Garden (KBG). In July 2018, we firstly observed flowering plants which were cultivated in KBG, also based on the floral characteristics; we confirmed that it is a member of *Oreocharis s.l.* Following a careful review of the relevant herbarium specimens and taxonomic publications of *Oreocharis* from Yunnan and the adjacent regions, we concluded that this species is new to science. *Oreocharis wumengensis* Lei Cai & Z.L.Dao is described for the first time below, and its morphological characters are compared with those of closely related species.

Material and methods

Samples of the new species were collected from living plants cultivated in KBG, originally introduced from Yanjin County, Yunnan. All available specimens of *Oreocharis s.l.* are stored in the herbaria (HITBC, IBK, KUN and PE) and Chinese Virtual Herbarium (<http://www.cvh.ac.cn/>) in China and Global Plants on JSTOR (<https://plants.jstor.org/>) were examined. We studied all morphological characters with dissecting microscopes, and described the morphological characters by using the terminology presented by Wang et al. (1990, 1998). The photographs were taken in the field and KBG by the first author.

Taxonomic treatment

***Oreocharis wumengensis* Lei Cai & Z.L.Dao, sp. nov.**

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Figures 1, 2

Diagnosis. *Oreocharis wumengensis* resembles *O. panzhouensis* in its floral characteristics, but can easily be distinguished from this species in the brown-pubescent, oblate petiole; the oblong, long elliptic to oblanceolate leaf blade; the glandular pubescent pedicel; the calyx 5-lobed to the base; and the apically coherent anthers.

Type. CHINA. Yunnan: Yanjin County, Miaoba Town, Liuchang Village, Houshanping, 27°52'N, 104°20'E, elev. ca. 1050 m, on moist rocks (cultivated in KBG), in flowering, 3 August 2018, *Lei Cai CL198* (holotype: KUN!, isotype: KUN!).

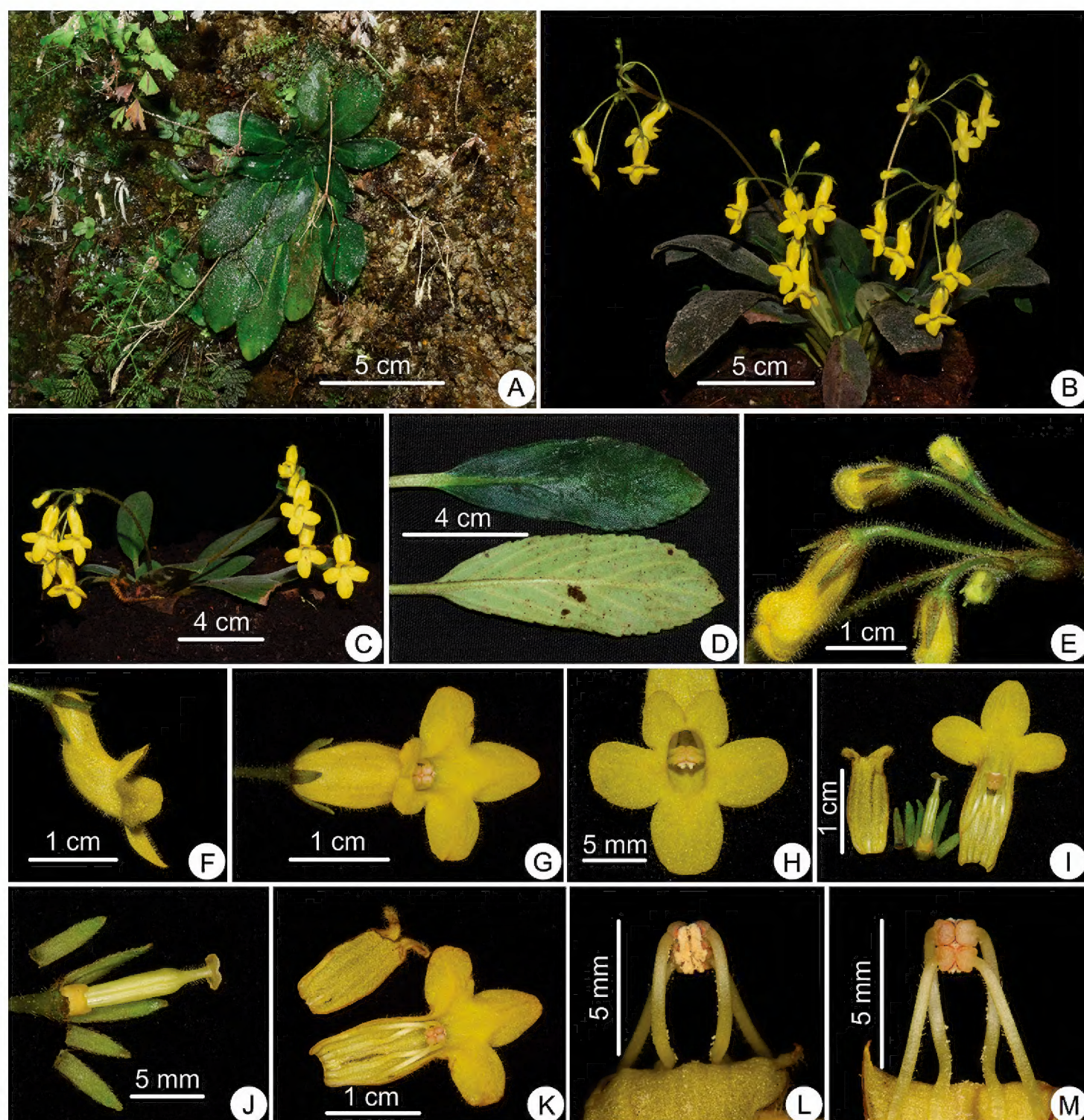


Figure 1. *Oreocharis wumengensis* Lei Cai & Z.L.Dao, sp. nov. **A** Plant in the wild **B, C** plants in cultivation in KBG **D** adaxial and abaxial leaf surfaces **E** inflorescence **F, G** side and top view of flowers **H** front view of flower **I** opened corolla with pistil and calyx **J** pistil with disc and calyx **K** opened corolla showing stamens and staminode **L** adnate anthers, abaxial view **M** adnate anthers, adaxial view. Photographed by Lei Cai.

Description. Perennial herb, rhizome 4–12 mm long, 3–5 mm in diameter. Leaves 8–20, basal, petiole oblate, 0.8–5.5 cm long, brown pubescent, leaf blade oblong, long elliptic to oblanceolate, $3.0\text{--}8.5 \times 0.8\text{--}2.8$ cm, adaxially densely appressed pubescent, abaxially pubescent, densely brown pubescent along veins, lateral veins 3–5 on each side of midrib, adaxially inconspicuous, adaxially conspicuous, apex acute, base cuneate, margin serrated, upper half obvious. Cymes axillary 2–4, inflorescence 4–10-flowered; peduncle 6.5–12 cm long, brown pubescent; bracts 2, lanceolate to elliptic, $5\text{--}7 \times 1.5\text{--}3$ mm, both sides appressed pubescent, margin nearly entire to denticulate; pedicel 1.5–4.5 cm long, glandular pubescent. Calyx 4–6 mm



Figure 2. Holotype of *Oreocharis wumengensis* Lei Cai & Z.L.Dao, sp. nov. (KUN-1444080).

long, 5-lobed to the base, lobes unequal, linear or narrowly triangular, 4–6 mm long, ca. 1.5 mm wide, outside brown pubescent and glandular pubescent, inside glabrous. Corolla sigmoid, yellow, 2.2–2.6 cm long, outside extremely sparsely brown pubescent and densely glandular pubescent, inside glandular pubescent in the throat and on adaxial lobes, slightly contracted at the throat, 1.2–1.4 cm long, 4–7 mm in diameter; limb 2-lipped; adaxial lip 2-lobed to near base, semiorbicular, lobes 2–3 × 2–3 mm, abaxial lip 3-lobed to base, semiorbicular to oval, 6–8 × 5–7 mm. Stamens 4, 5–8 mm long, adnate to corolla 4–6 mm from base; filaments linear, glandular pubescent; anthers horseshoe shaped, coherent apically, 2-loculed, dehiscing longitudinally, connective glabrous; staminode 1, ca. 0.5 mm long, inserted ca. 1 mm from base. Disc ca. 1.5 mm high, yellow, margin undulate. Pistil 0.8–1 cm long; ovary long cylindrical, glabrous, 4–6 mm long; style 2–3 mm long, glandular pubescent; stigma bilobed, flabellate. Old Capsule linear, ca. 2 cm long.

Phenology. Flowering from July to August; fruiting unknown.

Etymology. The specific epithet ‘*wumengensis*’ referring to the type locality where the new species was found, is located in the famous Wumeng Mountain area.

Vernacular name. The Chinese name for the new species is “Wū Méng Mǎ Líng Jù Tái” (乌蒙马铃苣苔).

Distribution and ecology. *Oreocharis wumengensis* is currently known only from one population of ca. 50 individuals at the type locality. The species could be endangered, but more data is needed to evaluate this reliably. The species was observed growing on moist rocks with other plants under forest cover in karst regions in Yanjin County, Yunnan.

Taxonomic affinities. *Oreocharis wumengensis* is morphologically unique with sigmoid corolla within *Oreocharis s.l.*, however there are certain similarities with other species in this genus. *O. wumengensis* is similar to *O. panzhouensis* in the shape of corolla, however, it is obviously different from the latter species. The comparison of morphologically characters on related species are provided in Table 1.

Table 1. Morphological comparison between *Oreocharis wumengensis* and *O. panzhouensis*.

Characters	<i>O. wumengensis</i>	<i>O. panzhouensis</i>
Petiole	oblate, brown pubescent	round, brown villous
Leaf blade	oblong, long elliptic to oblanceolate	ovate to suborbicular
Peduncle	brown pubescent	brown villous
Bract	lanceolate to elliptic	linear to subulate
Pedicel	glandular pubescent	brown villous
Calyx	5-lobed to the base, lobes linear or narrowly triangular	5-lobed to the middle, lobes broadly triangular
Corolla	sigmoid, yellow, slightly contracted at the throat, outside sparsely brown pubescent and densely glandular pubescent	pale yellow, tube campanulate, outside pubescent and glandular-pubescent
Filament	linear, glandular pubescent	flattened, glabrous
Anthers	horseshoe shaped, coherent apically	broadly oblong, separated
Style	glandular pubescent	glabrous

Acknowledgements

We thank Dr. Zhi-Kun Wu from the Guiyang University of Traditional Chinese Medicine and Ms. Li Zhong from Kunming Institute of Botany, Chinese Academy of Sciences for their assistance with the field work, and Ji-Dong Ya for his careful cultivation and management. This study was financially jointly supported by the Science & Technology Basic Resources Investigation Program of China (grant no. 2017FY100100), Yunnan Science and Technology Innovation Team Program for PSESP (Plant Species with Extremely Small Populations) Conservation and Utilization (Grant No. 2019HC015) and the Investigation of *Camellia* Resources in Yanjin County (2016–2018).

References

- Cai L, Chen RZ, Yin ZJ, Zhang GX, Chen WH, Shui YM (2015) *Tremacron hongheense*, a new species of Gesneriaceae from southeastern China. *Plant Diversity and Resources* 37: 733–736.
- Cai L, Huang H, Dao ZL, Wu ZK (2017) *Oreocharis parviflora*, a new species of Gesneriaceae from northwestern Yunnan, China. *Phytotaxa* 329(2): 167–172. <https://doi.org/10.11646/phytotaxa.329.2.7>
- Cai L, Guo Y, Zhang RM, Dao ZL, Wen F (2019) *Oreocharis panzhouensis* (Gesneriaceae), a new species from karst regions in Guizhou, China. *Phytotaxa* 393(3): 287–291. <https://doi.org/10.11646/phytotaxa.393.3.5>
- Chen RZ (2016) Study on seed morphology and DNA barcoding of *Oreocharis* s.l. (Gesneriaceae). Master thesis, Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, China. [In Chinese]
- Chen WH, Shui YM, Möller M (2014) Two new combinations in *Oreocharis* (Gesneriaceae) from China. *Candollea* 69(2): 179–182. <https://doi.org/10.15553/c2014v692a10>
- Chen WH, Middleton DJ, Nguyen HQ, Nguyen HT, Averyanov LV, Chen RZ, Nguyen KS, Möller M, Shui YM (2017) Two new species of *Oreocharis* (Gesneriaceae) from Northwest Vietnam. *Gardens' Bulletin (Singapore)* 69(2): 295–305. [https://doi.org/10.26492/gbs69\(2\).2017-08](https://doi.org/10.26492/gbs69(2).2017-08)
- Chen WH, Nguyen QH, Chen RZ, Nguyen TH, Nguyen SK, Nguyen VT, Möller M, Middleton DJ, Shui YM (2018) Two new species of *Oreocharis* (Gesneriaceae) from Fan Si Pan, the highest mountain in Vietnam. *PhytoKeys* 94: 95–106. <https://doi.org/10.3897/phytokeys.94.21329>
- Do VT, Wei YG, Wen F (2017) *Oreocharis caobangensis* (Gesneriaceae), a new species from Cao Bang Province, northern Vietnam. *Phytotaxa* 302(1): 65–70. <https://doi.org/10.11646/phytotaxa.302.1.6>
- Guo YF, Wang YQ (2014) Floral ecology of *Oreocharis pumila* (Gesneriaceae): A novel case of sigmoid corolla. *Nordic Journal of Botany* 32(2): 215–221. <https://doi.org/10.1111/j.1756-1051.2013.00105.x>

- Guo ZY, Li ZY, Xiang XG (2018) *Oreocharis duyunensis* (Gesneriaceae), a new species from Guizhou, China. *Nordic Journal of Botany* 36(9): e01514. <https://doi.org/10.1111/njb.01514>
- Han MQ, Pan B, Zou LL, Liu Y (2017) *Oreocharis purpurata*, a new species of Gesneriaceae from Hunan, China. *Phytotaxa* 328(2): 183–188. <https://doi.org/10.11646/phytotaxa.328.2.9>
- Li ZY, Wang YZ (2004) Plants of Gesneriaceae in China. Henan Science & Technology Publishing House, Zhengzhou, Henan, 14–47.
- Möller M (2015) Transfer of *Tremacron hongheense* to *Oreocharis* (Gesneriaceae). *Phytotaxa* 239(3): 295–296. <https://doi.org/10.11646/phytotaxa.239.3.12>
- Möller M, Middleton DJ, Nishii K, Wei YG, Sontag S, Weber A (2011) A new delineation for *Oreocharis* incorporating an additional ten genera of Chinese Gesneriaceae. *Phytotaxa* 23(1): 1–36. <https://doi.org/10.11646/phytotaxa.23.1.1>
- Möller M, Chen WH, Shui YM, Atkins H, Middleton DJ (2014) A new genus of Gesneriaceae in China and the transfer of *Briggsia* species to other genera. *Gardens' Bulletin (Singapore)* 66: 195–205.
- Möller M, Wei YG, Wen F, Clark JL, Weber A (2016) You win some you lose some: Updated generic delineations and classification of Gesneriaceae – implications for the family in China. *Guihaia* 36: 44–60.
- Möller M, Atkins HJ, Bramley GL, Middleton DJ, Baines R, Nguyen VD, Bui HQ, Barber S (2018) Two new species of *Oreocharis* (Gesneriaceae) from northern Vietnam. *Edinburgh Journal of Botany* 75(3): 309–319. <https://doi.org/10.1017/S0960428618000148>
- Wang WT, Pan KY, Li ZY (1990) Gesneriaceae. In: Wang WT (Ed.) *Flora Reipublicae Popularis Sinicae* Vol. 69. Science Press, Beijing, 141–271.
- Wang WT, Pan KY, Li ZY, Weitzman AL, Skog LE (1998) Gesneriaceae. In: Wu ZY, Raven PH (Eds) *Flora of China*. Vol. 18. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis, 254–401.
- Weber A, Middleton DJ, Forrest A, Kiew R, Lim CL, Rafidah AH, Sontag S, Triboun P, Wei YG, Yao TL, Möller M (2011a) Molecular systematics and remodeling of *Chirita* and associated genera (Gesneriaceae). *Taxon* 60(3): 767–790. <https://doi.org/10.1002/tax.603012>
- Weber A, Wei YG, Puglisi C, Wen F, Mayer V, Möller M (2011b) A new definition of the genus *Petrocodon* (Gesneriaceae). *Phytotaxa* 23(1): 49–67. <https://doi.org/10.11646/phytotaxa.23.1.3>
- Wei JJ, Xiong GC, Zou CY, Pan B, Xu WB (2016) *Oreocharis curvituba*, a new species of Gesneriaceae from northeastern Guangxi, China. *Phytotaxa* 280(2): 190–194. <https://doi.org/10.11646/phytotaxa.280.2.9>
- Xu WB, Guo J, Pan B, Zhang Q, Liu Y (2017) Diversity and distribution of Gesneriaceae in China. *Guihaia* 37(10): 1219–1226.
- Yang LH, Zhou LX, Kang M (2018) *Oreocharis ovata* (Gesneriaceae), a new species from Guangdong, China. *Nordic Journal of Botany* 36(11): e01764. <https://doi.org/10.1111/njb.01764>